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(54) **Hair-treatment compositions based on nonionic, weakly anionic or amphoteric surface-active agents and heteropolysaccharides**

(57) The invention relates to a cosmetic composition for hair containing, in a cosmetically acceptable medium, at least:

- a) a water-soluble polyglycerolated nonionic surface agent, or
- b) a weakly anionic surface-active agent from the group of polyalkoxycarboxylates, or
- c) an amphoteric surface-active agent from the group of the acylated derivatives of mono- or dicarboxylic, optionally cyclic, diamino acids, or
- d) their mixtures,

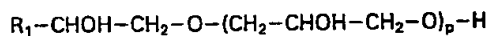
and at least one water-soluble heteropolysaccharide, which may be a xanthan gum or the product of fermentation of sugars by microorganisms.

## SPECIFICATION

**Cosmetic compositions based on nonionic, weakly anionic or amphoteric surface-active agents and heteropolysaccharides**

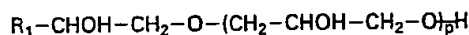
- 5 The present invention relates to cosmetic compositions intended particularly to be applied on hair, based on surfactants and heteropolysaccharides. 5
- Cosmetic compositions such as shampoos containing nonionic, weakly anionic or amphoteric surfactants are well known in the field of cosmetics and offer many advantages when compared to the compositions
- 10 containing strongly anionic surfactants; they have, in particular, a better skin tolerance. 10
- A "weakly anionic surfactant", as used herein, means a surfactant incorporating, in its hydrophilic chain, a carboxylic acid function and other hydrosolubilizing groups which gives it significant solubility in water in an acidic medium; in such a medium, they show a behaviour which is similar to that of nonionic surfactants. The hydrosolubilizing groups are generally "polyethoxy" concatenations.
- 15 Weakly anionic surface-active agents which are of interest are polyalkoxycarboxylates. 15
- Nonionic surface-active agents which are especially interesting because of their compatibility with the scalp and with hair, and particularly for persons with seborrhea problems, are water-soluble polyglycerolated surface-active agents, and particularly the condensation products of a monoalcohol, an  $\alpha$ -diol, an alkylphenol, an amide or a diglycolamide with glycidol or a glycidol precursor, which are described in French
- 20 Patent 2,091,516, as well as the compounds described in French Patents 1,477,048 and 2,328,763. 20
- Amphoteric surface-active agents used are generally acylated derivatives of mono- or di-carboxylic diamino-acids present, when appropriate, in their cyclic form.
- The use of surfactants of this type in liquid form is not easy because the composition is difficult to localize on the hair as it quickly flows towards the ends.
- 25 Furthermore, it has been found difficult to thicken compositions based on these surface-active agents with traditional thickeners such as cellulose derivatives, crosslinked acrylic acid polymers, guar gum derivatives, or polyethylene glycol esters, either because the solutions are unstable on storage, or because the addition of a thickener degrades the cosmetic properties on application to the hair and/or the good compatibility with greasy hair. 25
- 30 We have now found that, surprisingly, the use of water-soluble heteropolysaccharides made it possible to thicken compositions based on the particular surfactants referred to above without losing the advantages of these surfactants. In addition, it has been found, in particular, that there is a clear improvement in the foaming properties, particularly as regards the comfort and the softness of the foam, a surprising improvement in detergency and an improvement in the cosmetic properties, particularly as regards the
- 35 disentangling and the softness of wet and dried hair. 35
- These compositions are, furthermore, readily removed by rinsing with water.
- The present invention accordingly provides cosmetic compositions intended particularly to be applied on hair, containing at least one nonionic, weakly anionic or amphoteric surfactant, such as defined above and at least one water-soluble heteropolysaccharide. These compositions desirably do not contain a strongly
- 40 anionic surface-active agent nor an oxidizing agent. 40
- Thus the cosmetic compositions according to the invention are essentially characterised in that they comprise, in a cosmetically acceptable medium:
- a) at least one water-soluble, polyglycerolated, nonionic surface-active agent, preferably
- A) a condensation product of a monoalcohol, an  $\alpha$ -diol, an alkylphenol or an amide with glycidol or a
- 45 glycidol precursor, 45
- B) a compound corresponding to the formula:
- $$R_2O\{C_2H_5O-(CH_2OH)\}_qH$$
- 50 50
- in which  $R_2$  denotes an alkyl, alkenyl or alkaryl radical and  $q$  is a statistical average value from 1 to 10, these compounds being described more particularly in French Patent 1,477,048, and
- C) a compound corresponding to the formula:
- 55  $R_3CONH-CH_2-CH_2-O-CH_2-CH_2-O-(CH_2CHOH-CH_2-O)_r-H$  55
- in which  $R_3$  denotes a straight-chain or branched, saturated or unsaturated aliphatic radical containing between 8 and 30 carbon atoms, and optionally one or more hydroxy groups, of natural or synthetic origin,  $r$  denotes an integral or decimal number from 1 to 5 and denotes the average degree of condensation, and
- 60 mixtures thereof in which the  $R_3$  radicals can be different, such compounds being described more particularly in French Patent 2,328,763, or 60
- b) a weakly anionic surface-active agent from the polyalkoxycarboxylate group, or
- c) an amphoteric surface-active agent chosen from the acylated derivatives of mono- or dicarboxylic diamino acids, optionally in cyclic form, or
- 65 d) their mixtures, and at least one water-soluble heteropolysaccharide. 65

The nonionic surface-active agents of group (A) above correspond, in particular, to the formula:

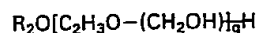


5 in which  $R_1$  denotes an aliphatic, alicyclic or arylaliphatic radical, preferably containing 7 to 21 carbon atoms (and mixtures), the aliphatic chains being capable of incorporating ether, thioether or hydroxymethylene groups and in which  $p$  is from 1 to 10 inclusive. Such compounds are described particularly in French Patent 2,091,516.

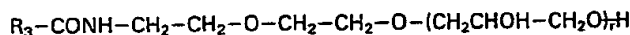
Among the nonionic surfactants defined above, those preferred more particularly correspond to the  
10 formula:



in which  $R_1$  denotes a mixture of alkyl radicals containing 9 to 12 carbon atoms and  $p$  has a statistical value of  
15 3.5, or else  $R_1$  denotes a  $C_{10}$  alkyl radical and  $p$  has a statistical value of 2.5, or

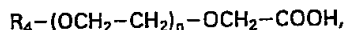


in which  $R_2$  denotes the group  $C_{12}H_{25}$  and  $q$  has a statistical value of 4 to 5, or  
20



where  $R_3$  denotes a mixture of radicals derived from lauric, myristic, oleic and copra acids and  $r$  has a statistical value from 3 to 4.

25 The surface-active agents from the polyalkoxycarboxylate groups which are particularly preferred are polyglycolic ether carboxylic acids corresponding to the formula:

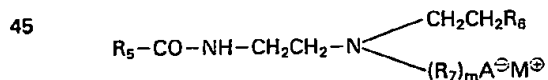


30 or salts thereof, where the substituent  $R_4$  corresponds to a straight chain containing from 6 to 18 carbon atoms and preferably from 12 to 18 carbon atoms and  $n$  is an integer from 5 to 25, preferably from 5 to 10.

Among the compounds belonging to this group, special mention can be made of the product sold at 90% strength of active material under the trade name "Akypo RLM 100" by Chem Y corresponding to the above formula, in which  $R$  denotes a mixture of alkyl radicals containing 12 to 14 carbon atoms and  $n$  is equal to 10;  
35 the product sold at 90% strength of active material under the trade name "Sandopan DTC Acide" by Sandoz, corresponding to the above formula, in which  $R$  denotes a group containing 13 carbon atoms and  $n$  is equal to 7, or salts of these compounds; the products sold under the trade name "Sandopan DTC linéaire gel" and "DTC linéaire acide", in which products  $R$  denotes a mixture of radicals containing from 12 to 15 carbon atoms and  $n$  is equal to 5; the product sold under the trade name "Sandopan KST", in which  $R$  denotes an  
40 alkyl radical containing 16 carbon atoms and  $n$  is equal to 12.

The amphoteric surface-active agents are suitably chosen from those described particularly in the CTFA dictionary, 3rd edition, 1982, and correspond to the following general formulae I and II.

The compounds of formula I correspond to the structure:



50 in which  $R_5$  denotes a straight chain or branched  $C_7$ - $C_{17}$  alkyl or alkenyl radical, an alkyl or alkenyl radical derived from a long-chain fatty acid such as that from copra or tallow,  
 $R_6$  denotes an  $-\text{OH}$ ,  $-\text{OCH}_2\text{CH}_2\text{COONa}$  or  $-\text{OCH}_2\text{CH}_2\text{COOH}$  group,  
 $R_7$  denotes  $-\text{CH}_2-$  or  $-\text{CH}_2-\text{CH}(\text{OH})-\text{CH}_2-$ ,



$\text{A}^\ominus$  denotes  $\text{COO}^\ominus$ ,

$\text{M}$  denotes hydrogen or an alkali metal,

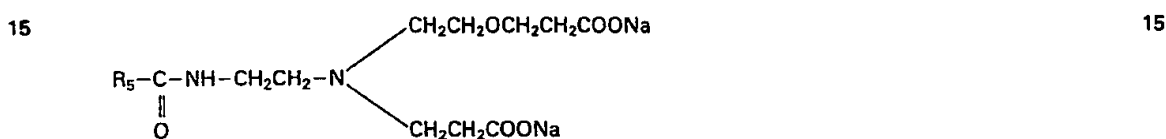
$m$  denotes 1 or 2.

The compounds of formula II have the structure:



in which  $\text{R}_8$  denotes a  $\text{C}_7$ - $\text{C}_{17}$  alkyl radical or an alkyl radical derived from copra.

Among the amphoteric surface-active agents which are more particularly preferred, mention may be made of the compound corresponding to the formula:



in which  $\text{R}_5-\text{C}-$  denotes the acyl radical derived from copra;



this compound is called "cocoamphocarboxypropionate" in the CTFA dictionary, 3rd edition, 1982, and sold by Miranol under the trade name Miranol C2M SF, and the corresponding acid form and the compound corresponding to the formula:



in which



denotes the acyl radical derived from copra, which corresponds to the trade name of "cocoamphocarboxyglycinate" in the CTFA dictionary, 3rd edition, 1982, and sold by Miranol under the trade name Miranol C2M conc.

The heteropolysaccharides employed in accordance with the invention are usually synthesised by the fermentation of sugars by microorganisms.

More particularly they may incorporate the xanthane gums produced by the bacteria *Xanthomonas Campestris* and the mutants or variants of the latter.

The xanthane gums generally have a viscosity of 600 to 1,650 cP for an aqueous composition containing 1% of xanthane gum (measured in a Brookfield type LVT viscometer at 60 rev/min) and have a molecular weight of 1,000,000 to 50,000,000.

The xanthane gums usually comprise 3 different monosaccharides in their structure, these being mannose, glucose and glucuronic acid in salt form.

Such products are, more particularly: Keltrol marketed by Kelco, a 1% aqueous solution of which has a Brookfield LVT viscosity at 60 rev/minute of 1,200 to 1,600 cP, Kelzan S marketed by Kelco, a 1% aqueous solution of which has a Brookfield LVT viscosity at 60 rev/minute of 850 cP, Rhodopol 23, 23U and 23C, marketed by Rhone-Poulenc, a 0.3% aqueous solution of which has a Brookfield LVT viscosity at 30 rev/minute of  $450 \pm 50$  cP, Rhodigel 23, marketed by Rhone-Poulenc, Deuteron XG marketed by Schöner GmbH, the viscosity of a 1% aqueous solution of which is 1,200 cP, measured in a Brookfield LVT viscometer at 30 rev/minute, Actigum CX9, marketed by Ceca, with a viscosity of 1,200 cP, measured in a Brookfield LVT viscometer at 30 rev/minute on a 1% aqueous solution; Kelzan K9 C57, the viscosity of a 1% aqueous solution of which is 630 to 1,000 cP, measured in a Brookfield LVS viscometer at 60 rev/min, marketed by Kelco, Kelzan K8 B12, the Rotovisco RVI, MVI de Haacke viscosity at  $25^\circ\text{C}$  of which is 1,000 at  $10 \text{ s}^{-1}$ , marketed by Kelco and Kelzan K3 B130, marketed by Kelco.

The heteropolysaccharides may also be chosen from;

a) the biopolymer PS 87 produced by the bacteria *Bacillus polymyxa* which comprises in its structure

glucose, galactose, mannose, fucose and glucuronic acid; this biopolymer PS 87 is described in EP-A- No. 23, 397,

b) the biopolymer S88 produced by the strain *Pseudomonas* ATCC 31554, which comprises in its structure rhamnose, glucose, mannose and glucuronic acid; this biopolymer is described in the patent G.B.

5 -A-2,058,106,

c) the biopolymer S130, produced by the strain *Alcaligenes* ATCC 31555, which incorporates in its molecule rhamnose, glucose, mannose and glucuronic acid; this biopolymer is described in the patent G.B.

-A- 2,058, 107,

d) the biopolymer S139 produced by the strain *Pseudomonas* ATCC 31644, which comprises in its molecule rhamnose, glucose, mannose, galactose and galacturonic acid; this biopolymer is described in U.S. Patent No. 4,454,316,

e) the biopolymer S198 produced by the strain *Alcaligenes* ATCC 31853, which comprises in its molecule rhamnose, glucose, mannose and glucuronic acid; this biopolymer is described in EP-A- 64,354,

f) the exocellular biopolymer produced by species of bacteria, yeasts, fungi or algae which are gram-positive or negative; this biopolymer is described in DE-A- 3,224,547.

The surfactants such as specified above are suitably present in an amount from approximately 0.5 to 30% and preferably approximately 1.5 to 15%, relative to the total weight of the composition.

The heteropolysaccharide is suitably present in an amount from approximately 0.1 to 2.5%, preferably 0.2 to 1.5% by weight.

20 These compositions have a pH which is generally from 3 to 9, and preferably from 4 to 7.

The compositions according to the invention may be employed as a shampoo or as hair treatment compositions such as anti-grease or anti-dandruff treatment and more particularly as rinsing compositions to be applied before or after dyeing, before or after bleaching, before or after permanent waving, before or after shampooing or between two stages of a shampoo in order to obtain a hair-conditioning effect.

25 The cosmetically acceptable medium is typically water or a water-alcohol mixture, which may contain, in addition to the surface-active agents defined above and the heteropolysaccharide, different adjuvants usually employed in cosmetics, such as perfumes, preserving agents, sequestering agents, cationic surface-active agents, cationic polymers, electrolytes and acidifying and alkalizing agents, with the exception, however, of the combination of a cationic polymer and an anionic polymer, oxidizing agents and strong anionic surfactants. The name "strong anionic surfactants" as used herein means surfactants derived from sulphonic, sulphuric, sulphosuccinic, succinic and sarcosinic acids.

The compositions according to the invention, containing a weakly anionic and/or amphoteric surface-active agent, preferably additionally contain an anti-grease or anti-dandruff agent.

35 When employed for an anti-grease treatment, they may particularly contain the compounds described in French Patents 2,000,882, 2,011,940 and 2,133,991, and more particularly S-carboxymethylcysteine, trans-thiolane-3,4-diol S,S-dioxide and oxathiazinone derivatives prepared according to French Patent No. 2,231,676 and more particularly the potassium salt of 6-methyl-1,2,3-oxathiazine-4-(3H)-one 2,2-dioxide.

40 When employed as anti-dandruff agents, they may particularly contain zinc or sodium pyridinethiones, bis-(2-pyridyl-1-oxide)disulphide, such as described in French Patent 2,308,624 and its addition products with salts of alkaline earth metals such as, more particularly, the complex of 2,3-dithiopyridine 1,1-dioxide with magnesium sulphate and substituted or unsubstituted 1-hydroxy-2-pyridones such as described in French Patent 2,191,904 and, in particular, the monoethanolamine salt of 1-hydroxy-4-methyl-6-(2,4,4-trimethylpentyl)-2-pyridone.

45 The present invention also provides a cosmetic treatment process essentially characterised in that the composition defined above is applied to hair and, if necessary, the hair is rinsed after a few minutes' application. The treatment may consist of:

(a) washing the hair with the composition, followed by a rinse,

(b) an anti-grease or anti-dandruff treatment followed, if appropriate, by a rinse after a few minutes' application, or

50 (c) a hair-conditioning treatment with the composition according to the invention which is applied before or after dyeing, before or after bleaching, before or after permanent waving, before or after shampooing or between two stages of a shampoo, followed, if appropriate, by a rinse.

The application of these compositions may also be preceded or followed by treatments with lotions containing various components which are active in respect of hair, such as polymers.

55 The following Examples further illustrate the present invention.

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*Example 1*

The following composition is prepared:

5	<ul style="list-style-type: none"> <li>- Polyglycerolated fatty diglycolamide</li> </ul>		
	$R-CO-NH-CH_2-CH_2-O-CH_2-CH_2-[O-CH_2-CHOH-CH_2]_{3.5}-OH$	10 g	5
	R: mixture of radicals derived from $C_{12}$ to $C_{18}$ natural fatty acids		
	<ul style="list-style-type: none"> <li>- Heteropolysaccharide sold under the trade name of Rhodopol 23C by Rhone-Poulenc</li> </ul>	1.0 g	
10	pH adjusted to 5 with lactic acid		10
	<ul style="list-style-type: none"> <li>- Colorants, stabilizers, water</li> </ul>	q.s. 100 g	

This composition is employed as a shampoo for washing hair.

15 *Example 2*

The following composition is prepared:

	<ul style="list-style-type: none"> <li>- Nonionic surfactant of formula</li> </ul>		
	$R-CHOH-CH_2-O(CH_2-CHOH-CH_2-O)_nH$	8.0 g	
20	R: mixture of $C_9-C_{12}$ alkyl radicals		20
	n denotes an average statistical value of approximately 3.5		
	<ul style="list-style-type: none"> <li>- Heteropolysaccharide sold under the trade name of Rhodopol 23U by Rhone-Poulenc</li> </ul>	1.5 g	
25	pH adjusted to 7 with hydrochloric acid		25
	<ul style="list-style-type: none"> <li>- Water, colorants, stabilizers</li> </ul>	q.s. 100 g	

This composition is employed as a shampoo for washing hair.

30 *Example 3*

The following composition is prepared:

	<ul style="list-style-type: none"> <li>- Nonionic surfactant of formula:</li> </ul>		
	$RCHOH-CH_2O[CH_2-CHOH-CH_2O]_nH$		
35	R = $C_9-C_{12}$ -alkyl		35
	n = 3.5 statistical value	10 g	
	<ul style="list-style-type: none"> <li>- Heteropolysaccharide sold under the trade name of Actigum CX9 by Ceca</li> </ul>	1.0 g	
	pH adjusted to 5 with hydrochloric acid		
40	<ul style="list-style-type: none"> <li>- Colorants, stabilizers</li> </ul>	q.s.	40
	<ul style="list-style-type: none"> <li>- Water,</li> </ul>	q.s. 100 g	

This composition is employed as a shampoo for washing hair.

45 *Example 4*

The following composition is prepared:

	<ul style="list-style-type: none"> <li>- Nonionic surfactant of formula</li> </ul>		
	$R-CHOH-CH_2O[CH_2-CHOH-CH_2O]_nH$		
50	R is a mixture of $C_9-C_{12}$ alkyl radicals		50
	n denotes an average statistical value of approximately 3.5	8.0 g	
	<ul style="list-style-type: none"> <li>- Sorbitol monolaurate polyoxyethylenated with 20 moles of EO, sold by Atlas under the trade name Tween 20</li> </ul>	5.0 g	55
55	<ul style="list-style-type: none"> <li>- Heteropolysaccharide sold under the trade name Keltrol by Kelco</li> </ul>	0.5 g	
	pH adjusted to 8 with triethanolamine		
	<ul style="list-style-type: none"> <li>- Colorants, stabilizers</li> </ul>	q.s.	
60	<ul style="list-style-type: none"> <li>- Water,</li> </ul>	q.s. 100 g	60

This composition is employed as a shampoo for washing hair.

*Example 5*

The following composition is prepared:

5	- Surfactant of formula		
	$C_{12}H_{25}-O-[C_2H_3O(CH_2OH)]_nH$		5
	n denotes an average statistical value of 4.2	10 g	
	- Heteropolysaccharide sold under the trade name		
	Rhodopol 23U by Rhone-Poulenc	0.5 g	
	- Stabilizers, perfume	q.s.	
10	- pH adjusted to 6 with hydrochloric acid		10
	- Water,	q.s. 100 g	

This composition is employed as a shampoo for washing hair.

15 *Example 6*

The following composition is prepared:

20	- Surfactant of formula:		
	$C_{12}-H_{25}-O-[C_2H_3O(CH_2OH)]_nH$		20
	n denotes an average statistical value of approximately 4.2	2.0 g	
	- Heteropolysaccharide sold under the trade name		
	Actigum CX9 by Ceca	1.5 g	
	- Colorant, stabilizers, perfume	q.s.	
25	- pH adjusted to 5 with hydrochloric acid		25
	- Water	q.s. 100 g	

This composition is applied to wet hair after a shampoo. After a few minutes' application the hair is rinsed with water.

30 *Example 7*

The following composition is prepared:

35	- Surfactant of formula:		
	$CH_3-(CH_2)_{11}-CH_2-(OCH_2CH_2)_7-OCH_2COOH$		35
	sold in 90% AS strength solution under the trade name "Sandopan DTC Acid" by Sandoz	8.0 g AS	
	- Heteropolysaccharide sold under the trade name		
	"Keltrol" by Kelco	0.5 g AS	
40	- Colorants, stabilizers, perfume	q.s.	40
	pH adjusted to 6 with hydrochloric acid		
	- Water	q.s. 100 g	

This composition is employed as a shampoo for washing hair.

45 *Example 8*

The following composition is prepared:

50	- Polyglycolic ether carboxylic acid of formula:		
	$R-(O-CH_2-CH_2)_{10}-OCH_2-COOH$		50
	in which R = C <sub>12</sub> -C <sub>14</sub> , sold in 90% AS strength under the trade name "Akypo.RLM.100" by Chem.Y.	1.5 g AS	
	- Heteropolysaccharide sold under the trade name		
	"Keltrol" by Kelco	0.8 g AS	
55	- Colorant, stabilizer, perfume	q.s.	55
	pH adjusted to 5 with hydrochloric acid		
	- Water	q.s. 100 g	

When applied on wet hair after a shampoo, this composition spreads very well. After a few minutes' application, the hair is rinsed with water.

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*Example 9*

The following composition is prepared:

5	- 38% strength AS amphoteric derivative sold under the trade name Miranol C2M conc. by Miranol	15.0 g AS	5
	- Heteropolysaccharide sold under the trade name of Keltrol by Kelco	1.0 g AS	
	- pH adjusted to 4 with hydrochloric acid		
	- Colorants, stabilizers, water	q.s. 100 g	
10	This composition is in the form of a thickened liquid which is employed as a shampoo. Hair washed with this shampoo is shiny, soft to the touch and disentangles readily.		

*Example 10*

15 The following composition is prepared: 15

	- Heteropolysaccharide sold under the trade name of Rhodopol 23U by Rhone-Poulenc	0.8 g	
20	- 38% strength AS amphoteric derivative sold under the trade name Moranol C2M conc. by Moranol	2.0 g AS	20
	- Potassium salt of 6-methyl-1,2,3-oxathiazin-4-(3H)-one 2,2-dioxide, sold by Hoechst under the trade name Acesulfam K	3.0 g	
	- pH adjusted to 7 with hydrochloric acid		
25	- Stabilizers, perfumes, water	q.s. 100 g	25

This composition is employed as a rinsing composition or "rinse" for the treatment of greasy hair.

*Example 11*

30 The following composition is prepared: 30

	- Heteropolysaccharide sold under the trade name of Rhodopol 23U by Rhone-Poulenc	1.0 g	
35	- 38% strength AS amphoteric derivative sold under the trade name Miranol C2M conc. by Miranol	2.0 g	35
	- zinc pyridinethione sold by Olin	0.8 g	
	- pH adjusted to 6.7 with hydrochloric acid		
	- Stabilizers, perfumes, water	q.s. 100 g	
40	This composition is employed as a rinsing composition or "rinse" for the anti-dandruff treatment.		

*Example 12*

The following composition is prepared:

45	- Nonionic surfactant of formula: $R-CHOH-CH_2-O-[CH_2-CHOH-CH_2-O]_p-H$ where R is a decyl radical and p denotes an average statistical value of 2.5	0.5 g AS	45
50	- Condensate of epichlorohydrin with a condensate of adipic acid and diethylenetriamine, prepared according to Example 1a of French Patent No. 2,252,840	0.5 g AS	50
	- Heteropolysaccharide sold under the trade name of Rhodigel 23 by Rhone-Poulenc	2.0 g AS	
55	- Distearyltrimethylammonium chloride	0.3 g AS	55
	- Colorants, stabilizers, perfume	q.s.	
	- pH adjusted to 8 with hydrochloric acid		
	- Water	q.s. 100 g	
60	This composition is applied to wet hair after a shampoo. After a few minutes' application the hair is rinsed with water.		



*Example 13*

The following composition is prepared:

5	– Nonionic surfactant of formula: R-CHOH-CH <sub>2</sub> -O-[LCH <sub>2</sub> -CHOH-CH <sub>2</sub> -O] <sub>p</sub> H where R is a decyl radical and p denotes an average statistical value of 2.5	10.0 g AS	5
	– Heteropolysaccharide sold under the trade name of Kelzan S by Kelco	0.9 g AS	
10	– pH adjusted to 6.5 with hydrochloric acid		10
	– Colorants, stabilizers, perfume	q.s.	
	– Water	q.s. 100 g	

This composition, which has a soft and agreeable foam is used for washing hair.

15 15

*Example 14*

A shampoo with the following composition is prepared:

20	– Heteropolysaccharide sold under the trade name of Actigum CX 9 by Ceca	0.5 g AS	20
	– Amphoteric derivative sold under the trade name of Miranol C2M SF by Miranol	10.0 g AS	
	– Colorants, stabilizers, perfume	q.s.	
	– pH adjusted to 7 with hydrochloric acid		
25	– Water	q.s. 100 g	25

This composition is used for washing hair and makes it soft and shiny.

30 30

*Example 15*

The following anti-dandruff composition is prepared:

	– Heteropolysaccharide sold under the trade name of Kelzan S by Kelco	1.0 g	
35	– Amphoteric derivative sold under the trade name of Miranol C2M SF by Miranol	2.0 g AS	35
	– Monoethanolamine salt of 1-hydroxy-4-methyl-6- (2,4,4-trimethylpentyl)-2-pyridone, sold under the trade name Octoptrox by Hoechst	1.0 g AS	
	– Colorants, stabilizers, perfume	q.s.	
40	– pH adjusted to 8 with hydrochloric acid		40
	– Water	q.s. 100 g	

This composition is applied to wet hair at the scalp skin and after a shampoo. After a few minutes' application, the hair is rinsed with water.

45 45

*Example 16*

The following composition is prepared:

50	– Heteropolysaccharide sold under the trade name of Rhodopol 23U by Rhone-Poulenc	1.5 g	50
	– Trideceth-7-carboxylic acid of formula CH <sub>3</sub> (CH <sub>2</sub> ) <sub>11</sub> CH <sub>2</sub> (OCH <sub>2</sub> CH <sub>2</sub> ) <sub>6</sub> OCH <sub>2</sub> COOH sold at 90% strength AS by Sandoz under the trade name Sandopan DTC Acide neutralized with sodium hydroxide	12.0 g AS	55
55	– Colorants, stabilizers, perfume	q.s.	
	– pH adjusted to 6 with sodium hydroxide		
	– Water	q.s. 100 g	

60 This composition is employed as a shampoo for washing hair.

60

**Example 17**

The following composition is prepared:

5	- Heteropolysaccharide sold under the trade name of Actigum CX 9 by Ceca	0.8 g	5
	- Sodium salt of trideceth-7-carboxylic acid, of formula $\text{CH}_3(\text{CH}_2)_{11}\text{CH}_2-(\text{OCH}_2\text{CH}_2)_6\text{OCH}_2\text{COONa}$ sold at 70% strength AS under the trade name of Sandopan DTC Linéaire Gel by Sandoz	1.0 g AS	10
10	- Potassium salt of 6-methyl-1,2,3-oxathiazine-4-(3H)one 2,2-dioxide, sold under the trade name of Acesulfam K by Hoechst	0.5 g	
	- Colorants, stabilizers, perfume	q.s.	
15	- pH adjusted to 4.5 with hydrochloric acid		15
	- Water	q.s. 100 g	

This composition is employed as a rinsing composition after a shampoo for the treatment of greasy hair.

**Example 18**

An anti-dandruff after-shampoo of the following composition is prepared:

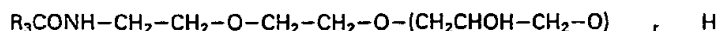
25	- Heteropolysaccharide sold under the trade name Kelzan K9 C 57 by Kelco	1.2 g	25
	- Sodium salt of trideceth-7-carboxylic acid, of formula $\text{CH}_3-(\text{CH}_2)_{11}-\text{CH}_2-(\text{O}-\text{CH}_2\text{CH}_2)_6-\text{OCH}_2-\text{COONa}$ sold at 70% strength AS under the trade name of Sandopan DTC Linéaire Gel by Sandoz	1.0 g AS	30
30	- Monoethanolamine salt of 1-hydroxy-4-methyl-6-(2,4,4-trimethylpentyl)-2-pyridone, sold under the trade name <i>Octopirax</i> by Hoechst	1.0 g AS	
	- Colorants, stabilizers, perfumes	q.s.	
35	- pH adjusted to 7 with hydrochloric acid		35
	- Water	q.s. 100 g	

**CLAIMS**

- 40 1. A composition suitable for application to human hair which comprises, in a cosmetically acceptable medium, at least one
- 45 a) water-soluble polyglycerolated nonionic surface-agent, or  
b) weakly anionic polyalkoxycarboxylate surface-active agent, or  
c) amphoteric surface-active agent which is an acylated derivative of a mono- or di-carboxylic, optionally cyclic, diaminoacid, or
- 50 d) a mixture of two or more thereof, and at least one water-soluble heteropolysaccharide.
2. A composition according to Claim 1, in which the water-soluble heteropolysaccharide is a xanthane gum having a molecular weight of 1,000,000 to 50,000,000 or polymers: biopolymer PS 87 produced by the bacterium *Bacillus polymyxa*, which comprises glucose, galactose, mannose, fucose and glucuronic acid in its structure; biopolymers S88, produced by the strain *Pseudomonas* ATCC 31554, S130, produced by the strain *Alcaligenes* ATCC 31555, and S198, produced by the strain *Alcaligenes* ATCC 31853, comprising rhamnose, glucose, mannose and glucuronic acid in their molecules; biopolymer S139, produced by the strain *Pseudomonas* ATCC 31644 comprising rhamnose, glucose, mannose, galactose and galacturonic acid in its molecules; and the exocellular biopolymer produced by the species of bacteria, yeasts, fungi or algae
- 55 which are gram-positive or negative.
3. A composition according to Claim 1 or 2 in which the nonionic surface-active agent is:
- (A) a condensation product of a monoalcohol, an  $\alpha$ -diol, an alkylphenol or an amide with glycidol or a glycidol precursor,
- (B) a product corresponding to the formula:
- 60 
$$\text{R}_2\text{O} \{ \text{C}_2\text{H}_3\text{O} - (\text{CH}_2\text{OH}) \}_q \text{H}$$

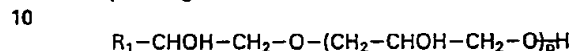
in which  $\text{R}_2$  denotes an alkyl, alkenyl or alkylaryl radical and q has a statistical value from 1 to 10,

(C) a product corresponding to the formula:



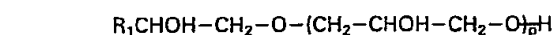
5 in which  $R_3$  denotes a straight-chain or branched, saturated or unsaturated aliphatic radical containing 8 to 30 carbon atoms and optionally one or more hydroxyl groups, of natural or synthetic origin,  $r$  denotes an integral or decimal number from 1 to 5.

4. A composition according to Claim 1 or 2 in which the nonionic surface agent is a product corresponding to the formula:



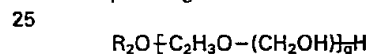
in which  $R_1$  denotes an aliphatic, alicyclic or arylaliphatic radical containing 7 to 21 carbon atoms, the aliphatic chains optionally containing one or more ether, thioether or hydroxymethylene groups and  $p$  is from 1 to 10.

15 5. A composition according to claim 4 in which the nonionic surface-active agent is a product corresponding to the formula:



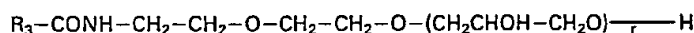
where  $R_1$  denotes an alkyl radical containing 9 to 12 carbon atoms and  $p$  has a statistical value of approximately 3.5, or else  $R_1$  denotes a decyl radical and  $p$  has a statistical value of 2.5.

6. A composition according to Claim 1 or 2 in which the nonionic surface agent is a product corresponding to the formula:



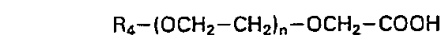
in which  $R_2$  denotes a  $\text{C}_{12}\text{H}_{25}$  group and  $q$  has a statistical value of 4 to 5.

7. A composition according to Claim 1 or 2, characterised in that the nonionic surface agent corresponds to the formula:



where  $R_3$  denotes a radical derived from lauric, myristic, oleic or copra acid and  $r$  has a statistical value from 3 to 4.

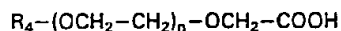
8. A composition according to any one of the preceding claims in which the polyalkoxycarboxylate is a carboxylic acid of a polyglycolic ether corresponding to the formula:



or a salt thereof, where  $R_4$  is a straight chain radical containing from 6 to 18 carbon atoms and  $n$  is an integer from 5 to 25.

9. A composition according to Claim 8 in which  $R_4$  is an alkyl group containing 12 to 18 carbon atoms and  $n$  is an integer from 5 to 10.

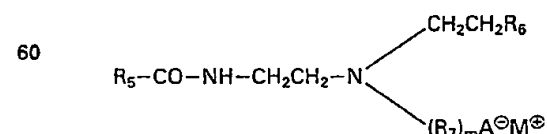
10. A composition according to Claim 9 in which the weakly anionic surface-active agent is a product corresponding to the formula:



50 in which:

- a)  $R_4$  denotes a mixture of alkyl radicals containing 12 to 14 carbon atoms and  $n$  is equal to 10;
- b)  $R_4$  denotes a group containing 13 carbon atoms and  $n$  is equal to 7; or
- c)  $R_4$  denotes a mixture of alkyl radicals containing from 12 to 15 carbon atoms and  $n$  is equal to 5; or
- d)  $R_4$  denotes an alkyl radical containing 16 carbon atoms and  $n$  is equal to 12.

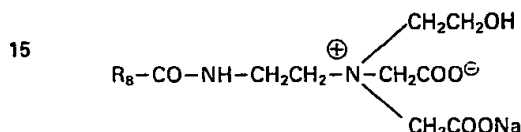
11. A composition according to any one of the preceding claims in which the amphoteric surfactant corresponds to the formula:



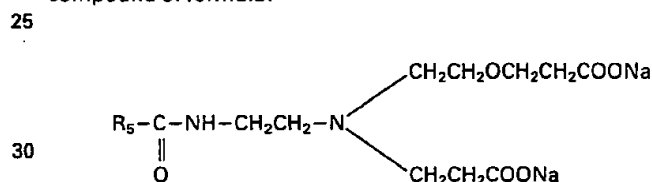
in which  $R_5$  denotes a  $C_7$ - $C_{17}$  straight-chain or branched alkyl or alkenyl radical, or an alkyl or alkenyl radical derived from a long-chain fatty acid,  
 $R_6$  denotes an OH,  $OCH_2CH_2COONa$  or  $OCH_2CH_2COOH$  group;  
 $R_7$  denotes  $-CH_2-$ ;  $CH_2-CH-CH_2-$



$A^{\ominus}$  denotes a  $COO^{\ominus}$  group  
 $M$  denotes H or an alkali metal;  
 $m$  denotes 1 or 2  
 or

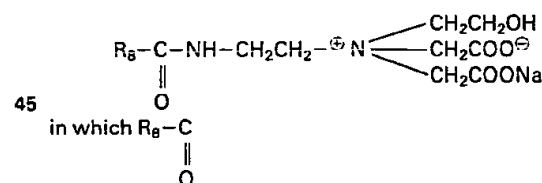


- 20 in which  $R_8$  denotes an alkyl group containing 7 to 17 carbon atoms or an alkyl group derived from copra. 20  
 12. A composition according to Claim 11 in which in formula I the alkyl radical derived from a long-chain fatty acid is a radical derived from copra or tallow.  
 13. A composition according to Claim 11 or 12, in which the amphoteric surface-active agent is a compound of formula:



in which  $R_5-C(=O)-$   
 denotes the acyl radical derived from copra.

14. A composition according to Claim 11 in which the amphoteric surface-active agent corresponds to the formula:



in which  $R_8-C(=O)-$   
 denotes the acyl radical derived from copra.

15. A composition according to any one of Claims 2 to 14 in which the xanthane gum has a viscosity of 600 to 1,650 cP for an aqueous composition containing 1% of xanthane gum, measured in a Brookfield type LVT viscometer at 60 rev/min.  
 16. A composition according to any one of the preceding claims in which the surface-active agent is present in a proportion of 0.5 to 30% by weight.  
 17. A composition according to any one of Claims 1 to 16 in which the heteropolysaccharide is present in a proportion of 0.1 to 2.5% by weight.  
 18. A composition according to any one of Claims 1 to 17 which has a pH of 3 to 9.  
 19. A composition according to any one of Claims 1 to 18 in which the cosmetically acceptable medium is water or a water-alcohol mixture.  
 20. A composition according to any one of Claims 1 to 19 which contains at least one perfume, preserving agent, sequestering agent, cationic surface-active agent, cationic polymer or electrolyte, with the exception of an anionic polymer when the composition contains a cationic polymer and with the exception of oxidizing agents and strongly anionic surfactants.  
 21. A composition according to any one of Claims 1 to 20 which contains an anti-grease or anti-dandruff agent.

22. A composition according to Claim 1 substantially as described in any one of the Examples.
23. A process for treating the hair which comprises applying thereto at least one composition as claimed in any one of Claims 1 to 22.
24. A process for washing the hair which comprises applying thereto at least one composition as claimed in any one of Claims 1 to 22 and then rinsing the hair. 5
25. An anti-grease or anti-dandruff hair treatment process which comprises applying to the hair at least one composition as claimed in Claim 21 and optionally rinsing the hair after a few minutes' application.
26. A hair conditioning process which comprises applying to the hair at least one composition as claimed in any one of Claims 1 to 22, before or after permanent waving, before or after shampooing or between two 10 stages of a shampoo. 10

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